CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

22 MAY 2019 (a.m.)

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FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE | 0 | 1 | 3 | 7 | 4 | 0 | 2 | 0 |

SUBJECT INDUSTRIAL TECHNOLOGY
OPTION C – BUILDING AND FURNITURE TECHNOLOGY – Paper 02

543

PROFICIENCY TECHNICAL

REGISTRATION NUMBER | | | | | | | | | | |

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FORM TP 2019083

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MAY/JUNE 2019

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INDUSTRIAL TECHNOLOGY

OPTION C – BUILDING AND FURNITURE TECHNOLOGY

Paper 02 – Technical Proficiency

2 hours 10 minutes

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READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of FIVE compulsory questions.
2. Use sketches where necessary to support your answers.
3. Write your answers in the spaces provided in this booklet.
4. Do NOT write in the margins.
5. You may use a silent, non-programmable calculator to answer questions.
6. This paper contains metric dimensions only. You should work your answers in the metric system.
7. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
8. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

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NOTHING HAS BEEN OMITTED.

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BUILDING AND FURNITURE TECHNOLOGY

Answer all questions.

This paper contains metric dimensions only. You should work your answers in the metric system.

1. (a) (i) State TWO components of the natural environment.

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(2 marks)

(ii) Define the term 'built environment'.

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(1 mark)

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(b) (i) Define the term 'climate change'.

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(1 mark)

(ii) Suggest TWO ways in which climate change negatively impacts the Caribbean.

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(2 marks)

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(c) The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on climate change.

Describe the Kyoto Protocol.

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(2 marks)

(d) State ONE advantage and ONE disadvantage of using EACH of the following building structures:

(i) Framed building structure

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Advantage

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Disadvantage

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(2 marks)



(ii) Solid building structure

Advantage

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Disadvantage

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(2 marks)

(e) Using the plan of the small building given in Figure 1, insert the symbol used to represent EACH of the following structures indicated by the labelled arrows:

- A single door
- A window
- TWO circular columns at the corners of the small section
- A step outside the door to include a landing, two threads and three risers

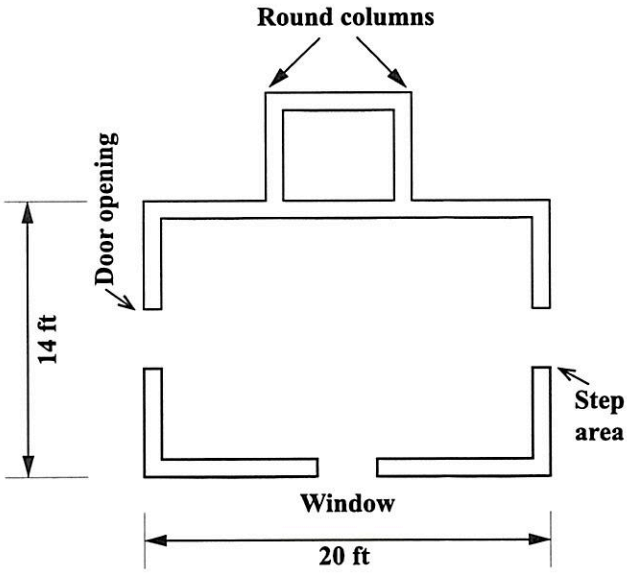


Figure 1. Plan of small building

(6 marks)

Total 18 marks

2. (a) Define EACH of the following terms associated with site works:

(i) Backfilling

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(ii) Earthing

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(iii) Salvaging

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(3 marks)

(b) List THREE responsibilities of a building contractor.

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(3 marks)

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(c) Figure 2 shows a picture of one type of excavator used in completing the foundation for a building. Tests have shown that the solid rock is approximately 2 metres below the top-soil.



Figure 2. Excavator

Outline THREE operations that would be involved in completing the excavation required for the foundation.

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(6 marks)

(d) A variety of tests is used to ensure that subsequent mixes of concrete are of the same consistency. Figure 3 shows the results of slump tests conducted on three separate samples of concrete, labelled I–III that were taken from a construction site.

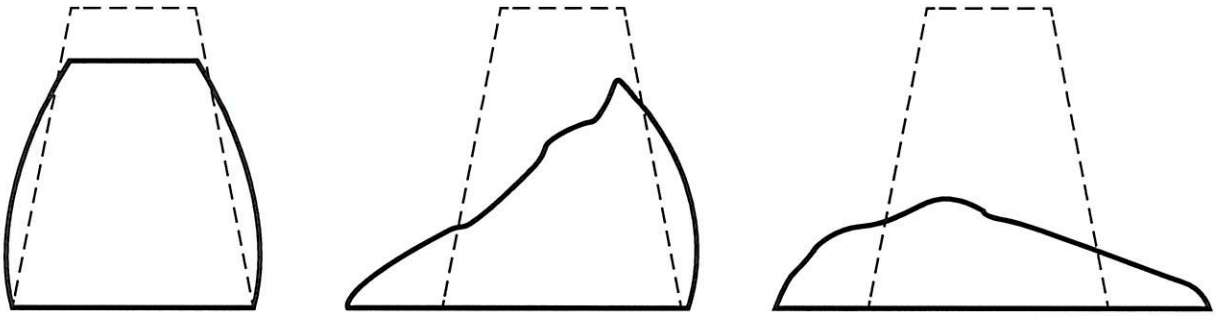


Figure 3. Results of slump test on concrete samples

Analyse EACH of the THREE samples in Figure 3 with respect to the desired properties of concrete, and outline your interpretation of EACH sample.

I

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II

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III

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(6 marks)

Total 18 marks

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3. (a) Differentiate between a 'hip roof' and a 'gable roof' in relation to the type of rafters used.

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(2 marks)

(b) Figure 4 shows the ground floor outline of a T-shaped building. A roof is to be designed to thoroughly cover the building. The roof design should allow water to run off on each side of the building.

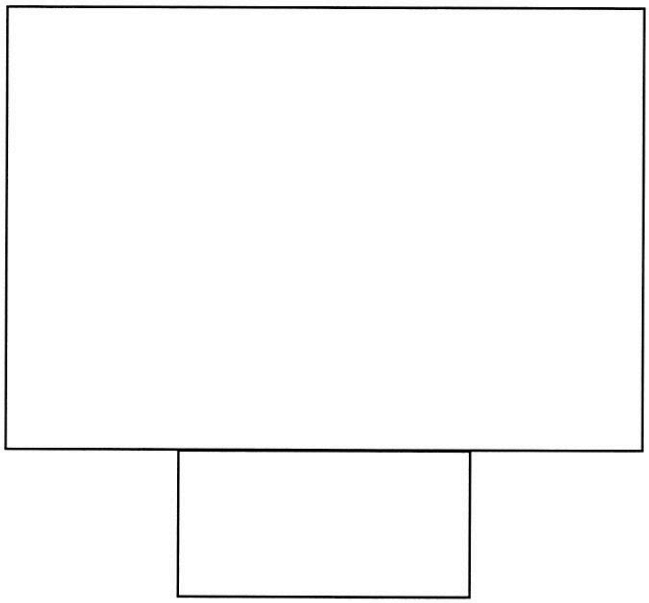


Figure 4. Ground floor outline of a T-shaped building

(i) On the ground floor outline of the building in Figure 4, sketch a suitable roof plan that meets the criteria given above. **(3 marks)**

(ii) Label FOUR of the roof members sketched on Figure 4. **(4 marks)**

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(c) (i) State THREE sequential steps used in constructing a 'hipped and valley' roof.

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(3 marks)

(ii) Calculate the length of the ridge for the roof design of Section A of the building in Figure 4. **Show ALL steps in your calculation.**

(3 marks)

(d) (i) State ONE advantage of using EACH of the following as a roof covering.

Shingles

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Corrugated roof sheeting

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(2 marks)

(ii) State ONE disadvantage of using a corrugated roof sheeting:

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(1 mark)

Total 18 marks

4. (a) State TWO methods of sewage disposal.

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(2 marks)

(b) Table 1 shows types of plumbing pipes, the materials from which they are made, their uses and methods of joining.

Complete Table 1 by inserting the missing plumbing information in the spaces labelled (i)–(iv).

TABLE 1: PLUMBING MATERIALS AND THEIR USES

Type of Pipe	Type of Material	Suitable Usage	Method of Joining
Galvanized steel	Metallic	(iii)	Threaded
Copper	Metallic	Hot or cold running water	(iv)
(i)	Plastic	Cold running water or waste	Socket or threaded
(ii)	Plastic	Hot and cold running water	Socket or threaded

(4 marks)

(c) Explain the functions of any THREE of the following plumbing fittings in a building situation:

- Traps
- Elbows
- Valves
- Tees

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(6 marks)

(d) A concrete, cylindrical water storage tank measuring 1.2 m in diameter and 1.8 m high is to be installed at a dwelling house. This storage tank is to be filled with drinking water.

Calculate EACH of the following measurements of the storage tank based on the dimensions given. **Show ALL steps in your calculation**.

(i) Circumference of the base of the storage tank

(ii) Volume of the storage tank

(6 marks)

Total 18 marks

5. Figure 5 shows the design of a wooden shelf unit that is to be constructed for an office.

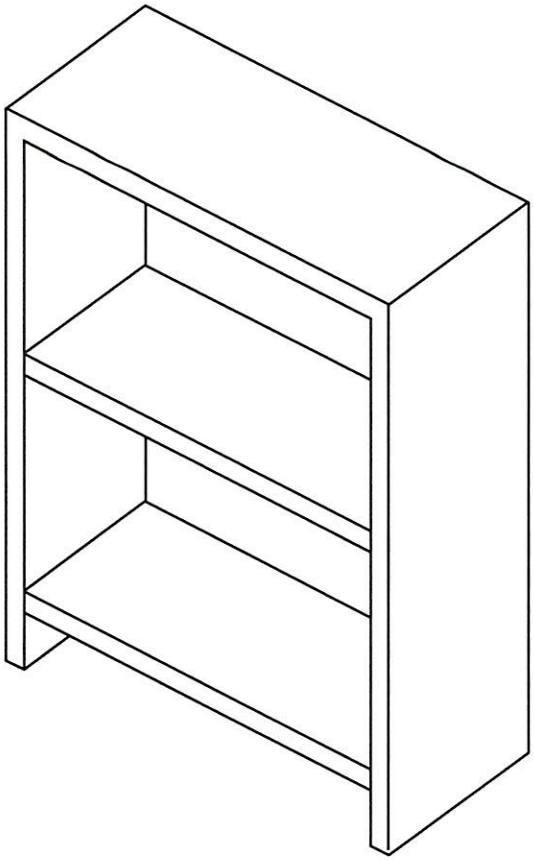


Figure 5. Wooden shelf unit

(a) Suggest TWO natural timbers and ONE man-made board that can be used in the construction of the shelf unit in Figure 5.

Natural timbers

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Man-made board

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(3 marks)

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(b) (i) State ONE advantage of EACH of the following types of materials for use in constructing the shelf unit in Figure 5.

Natural timbers

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Man-made boards

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(2 marks)

(ii) State TWO disadvantages, other than size, of using EACH of the following types of materials in constructing the shelf units in Figure 5.

Natural timbers

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Man-made boards

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(4 marks)

(c) Suggest THREE timber joints that can be used to join the parts of the shelf unit in Figure 5.

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(3 marks)

(d) (i) List THREE steps of the procedure required to glue the parts of the shelf unit together.

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(3 marks)

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(ii) List THREE sequential steps of procedure for the safe use of the jointer when surfacing natural timber to the desired thickness for the parts of the shelf unit.

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(3 marks)

Total 18 marks

END OF TEST

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CANDIDATE'S RECEIPT

INSTRUCTIONS TO CANDIDATE:

1. **Fill in all the information requested clearly in capital letters.**

TEST CODE: | 0 | 1 | 3 | 7 | 4 | 0 | 2 | 0 |

SUBJECT: INDUSTRIAL TECHNOLOGY
OPTION C – BUILDING AND FURNITURE TECHNOLOGY – Paper 02

PROFICIENCY: TECHNICAL

REGISTRATION NUMBER: | | | | | | | | | | |

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FULL NAME: _____
(BLOCK LETTERS)

Signature: _____

Date: _____

2. **Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.**

3. **Keep it in a safe place until you have received your results.**

INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

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I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: _____
Supervisor/Invigilator

Date: _____